

Executive Summary

The purpose of this report is to analyze a proposed redesign for the Coppin State University Physical Education Complex. Currently the complex utilizes a variable air volume (VAV) system to serve the various spaces in the complex. Highly efficient boilers, chillers and cooling towers help serve the loads of the complex, which are located in the future central utility plant. The plant also has connections and space anticipating the future renovations to the campus.

A mechanical depth was analyzed by redesigning the mechanical systems in two ways. The first addition was a ground source heat pump system for zones A and B of the complex. These two zones were chosen for this system because they are the only areas of the complex that run year round. The second system analyzed was utilizing heat recovery chiller during non-peak load times for the boiler.

With the addition of this equipment the building and construction process would be affected overall. Two depths were investigated to see how this redesign would affect the construction process and the current electrical systems. The site, schedule and installation of these systems were evaluated for the construction breadth. The existing Motor Control Centers were evaluated for the addition of the major equipment being added for the electrical breadth.

Adding both these systems drastically affect the cost and energy savings year round for the complex. An in-depth study of the energy saved, emissions and 30-year life cycle cost was performed in order to see the benefits of adding these systems.